AMENDMENTS TO SPECIFICATION

On page 1, before paragraph [0001], the following headings are added:

BACKGROUND

A. Field

On page 1, before paragraph [0002], the following heading is added:

B. Related Art

On page 1, paragraph [0002] is amended to read:

[0002] To provide a readily machine-readable coding for a security paper it was proposed in the patent US 6,974,623 ~~print WO 01/48311~~ to provide the security paper with at least two types of mottling fibers that differ with regard to their luminescent properties. Only one of the different mottling fibers is in each case located in defined, nonoverlapping partial areas of the security paper, so that the geometric arrangement of the partial ar-eas and the presence or absence of mottling fibers permit a coding to be produced. However, the number of thus producible geometric arrangements is limited due to the very limited space available on a security paper.

On page 1, paragraph [0004] is deleted.

On page 1, before paragraph [0005], the following heading is added:

BRIEF SUMMARY OF THE DISCLOSURE

On page 1, paragraph [0005] is amended to read:

[0005] According to the invention, the coding has at least one pair of mutually associated luminescent substances, each pair including ~~having~~ first and second luminescent substances which emit in a joint emission range located outside the visible spectral range. The emission spectra of the first and second luminescent substances overlap in at least a subrange of the stated emission range such that the emission spectrum of the first luminescent substance is complemented characteristically by the emission spectrum of the second luminescent substance. This provides a high-quality and high-security coding in which the spectral resolution of the mutually complementary luminescence emissions can only be

obtained with great technical effort. At the same time, a large number of codings can be produced by the multiplicity of possible pairs of luminescent substances.

On page 3, paragraph [0011] is amended to read:

[0011] According to another advantageous variant, the first and/or second luminescent substance is a luminescent substance based on a host lattice doped with a chromophore, the chromophore being selected from the group of scandium, titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper and zinc. The dopants and host lattices stated in US 2004/0105962 ~~WO 02/070279~~ are also suitable for use as luminescent sub-stances in inventive codings. At least one of the host lattices can be doped with a plurality of chromophores. Obviously, the two variants can be combined, i.e. one of the luminescent substances formed on the basis of a rare earth doped host lattice, the other luminescent substance on the basis of a host lattice with a chromophore.

On page 3, paragraph [0012] is amended to read:

[0012] The host lattice can have for example a perovskite structure or a garnet structure. At least one of the host lattices can also be formed by a mixed crystal. Further possible embodiments of the host lattices and the dopants are specified in US 4,452,834 ~~EP-B-0 052 624~~ or US 4,451,530 ~~EP-B-0 053 124~~, whose disclosures are included in the present application in this respect.

On page 4, paragraph [0016] is amended to read:

[0016] According to an advantageous development of the invention, the coding contains a further or third luminescent substance which has at least one emission line outside the stated subrange. The emission line is preferably outside the visible spectral range, in particular in the infrared spectral range above 1100 nm. "Infrared spectral range" is understood according to the invention to be the wavelength range from 750 nm and more, preferably 800 nm and more.

On page 4, paragraph [0018] is amended to read:

[0018] It is also possible to provide still further luminescent substances which further complement the inventive pair of luminescent substances. Thus, the additional luminescent

substances can emit in the same subrange of the spectrum and further complement the emission spectrum of the inventive pair of luminescent substances.

On page 5, paragraph [0023] is amended to read:

[0023] One or more of the luminescent substances can also be incorporated into the volume of the value document, in particular the value document substrate. Incorporating the luminescent substances into the volume of a paper substrate can be done for example by a method as described in the prints ~~EP-A-0-659-935~~ US 5,897,746, US 6,936,138 and US 7,175,739 ~~DE-101-20-818~~. The disclosures of the stated prints are included in the present application in this respect.

On page 6, before paragraph [0025], the following heading is added:

DESCRIPTION OF THE DRAWINGS

On page 6, before paragraph [0028], the following heading is added:

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS OF THE INVENTION

On page 6, paragraph [0028] is amended to read:

The coding 11 contains two pairs of mutually associated luminescent substances 12, 13 and 14, 15 as described above which, after excitation, show emissions in the infrared spectral range between 1000 and 1500 nm which overlap each other complementarily in each case in a subrange, as described more closely hereinafter. The arrangement of areas 16 with the first pair of luminescent substances 12, 13, areas 17 with the second pair of luminescent substances 14, 15 and areas 18 without luminescent substances along given geometric patterns permits any information, for example a product code, to be represented by the coding 11.

On page 6, paragraph [0029] is amended to read:

[0029] The first pair of luminescent substances comprising first and second luminescent substances 12 and 13 are each formed on the basis of a neodymium doped host lattice and each have an emission line in the range around 1064 nm, as shown in the left-hand part of Fig. 2. The two luminescent substances 12, 13 are formed on the basis of different

host lattices, however, which produce crystal fields of different strength at the site of the neodymium ion.

On page 7, paragraph [0032] is amended to read:

[0032] The middle part of Fig. 2 shows the emission patterns 24 and 25 of the second pair of luminescent substances including first and second luminescent substances 14 and 15 ~~of the second pair of luminescent substances~~ in the subrange relevant for them at wavelengths from 1150 to 1250 nm. In this embodiment, the first and second luminescent substances 14, 15 are each formed on the basis of a host lattice doped with a chromophore, the chromophore being selected from the group of scandium, titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper and zinc. As with the first pair of luminescent substances, it is practically impossible to derive the type of luminescent substances used from the envelope of the luminescence emissions of the two luminescent substances 14, 15 without further information.

On page 7, paragraph [0034] is amended to read:

[0034] The coding 11 can also contain, besides the two pairs of luminescent substances 12, 13 and 14, 15, a further (e.g., a third) luminescent substance which shows an emission at a wavelength above 1100 nm after excitation. The emission wavelength is coordinated so as not to fall within the overlapping ranges of the first or second pair of luminescent substances. The presence or absence of the further luminescent substance in certain areas can likewise be used for coding, thereby further increasing the number of coding possibilities.